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ABSTRACT

The purposes of the lecture method in higher education are considered. The advocates of lecturing claim that this approach can be used to present knowledge to students, to foster intellectual skills, and to change students' attitudes and values. Research evidence suggests that: the lecture can be effective for expounding facts and principles, lectures are less effective in stimulating thought than methods such as small group discussions, and lectures may or may not be effective in shaping attitudes. It is advisable for the lecturer to reduce the amount of material in the lecture by covering it in supplementary learning activities (e.g., texts, learning packages). Editing the lecture material and the use of handouts, lecture-notes, and reading lists are also helpful. Using other teaching methods for variety, such as demonstrations and group exercises, provides variety and effective means for presenting a subject. Lectures can also be used in special ways: (1) to show concepts, logical sequences, and causal relationships (network analysis); (2) to illustrate the application of a discipline's principles; and (3) to review and expand the learning experience. (SW)

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TEACHING IN HIGHER EDUCATION SERIES : 2

Suggestions for the consideration of lecturers and others concerned with teaching in higher education

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WHY LECTURE?

HE 016 160

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FOREWORD

This booklet is one of a series produced with the aid of a grant from the University Grants Committee as part of its programme for the development of knowledge about and skill in teaching in higher education. The series is intended to bring together traditional wisdom (not a source to be neglected) research findings when available and relevant, and summaries of what is regarded by the informed as good practice.

The sub-title "Suggestions for the consideration of those concerned ..." echoes that of a famous manual for the guidance of elementary school teachers and this series shares the same purpose. The handbooks may at times be mildly hortatory but they are not meant to be prescriptive. Teaching is something of an art and the aim is to encourage, within sensible limits, something of a personal style. The "rules" (if such they be) are constantly broken by successful teachers but few, if any, get away with breaking all the rules all the time.

Universities and other institutions of higher education have traditionally accepted research and teaching as their principal functions. The systems developed for training in research are well worked out. Till now little has been done for teaching. The initiative taken by the University Grants Committee was widely welcomed and has led to an increasing awareness in higher education generally of the importance of giving to the teaching function the attention it deserves. This series is intended to offer help to those who wish to make an effort to improve their teaching. It is hoped that those who read these pages will, as a result, be better prepared for this important aspect of their daily work.

The authors would be glad to receive reports and illustrative material which readers may wish to send with a view to improving the next edition of these booklets.

C.F. CARTER
Vice-Chancellor
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INTRODUCTION

Our introduction to the lecture is in two parts. We have assumed, as surveys suggest, that newly appointed lecturers are more immediately concerned with practice and performance than with questions about how to use the lecture. "Lecturecraft" therefore comes first. It sets out an amalgam of traditional lore and tips based on the conclusions of educational researchers and theorists. It also considers the problem of addressing a large audience.

This present booklet asks "Why Lecture?" In introducing "Lecturecraft" we expressed the hope that when the new lecturer becomes accomplished and uses his skills with deliberation in the service of his students then he will ask "Why Lecture?" It is equally possible that exploration of the ways in which the lecture can be used purposefully and with discrimination will lead back to the need for skill in presentation. The two booklets are complementary.

The lecture is often thought of as an all-purpose tool. "Why Lecture?" looks at the particular purposes the lecture best serves. The lecture is often spoken of

as an anachronism - why lecture at all? This booklet gives some answers to that question.

We begin (Part I: "The lecture defined") by asking you to recognise from the start that a lecture can be more than a 50-minute discourse. The way you see the lecture may be inherited; have you thought about this at all? The lecture, as a teaching method, must also be looked at through the eyes of educational research workers, distinguished teachers and students.

Part II: "To expound" tackles the lecture's primary function. Expository lectures can fail to inform; reduction of content is often necessary, parallel presentation of some of the material can be made using other methods; lecture-notes and handouts may be necessary supports. Part III: "For variety" further explores the relation of lecturing and other teaching methods, while in Part IV: "For special effects" we give examples of other kinds of lecture.

Part V: "Taking stock" summarises the lecture's role in university teaching as an old hand sees it. It is difficult to introduce the lecture without defending it. "Lecture-bashing" is good sport - it began with Dr. Johnson. But the defects of lectures, and of lecturers, are too easily caricatured; its virtues are often neglected.

PART I

THE LECTURE DEFINED

Everyone knows what a lecture is and what it is used for; everyone has a fairly clear idea of what students learn from lectures. But our thesis is that while a general definition can be pared down to "Lecture means a teaching period occupied wholly or mainly with continuous exposition by the lecturer"[1] this does not embrace what can and does take place within a lecture. Or "Fifty minutes of continuous, coherent, spoken exposition"[2] - most lectures probably fit this classification. But definitions like this are reductive and retrospective; experienced teachers use the lecture to present material in a variety of ways and for a variety of purposes.

A lecture is a distinctive teaching method, it is an expository method, but a lecture is what the lecturer makes of it. It is probably more immediately useful for the new lecturer to look at the way his colleagues lecture and to consider the range and diversity of individual lectures than it would be to discuss the precise limits of a lecture's value in general terms. Many new lecturers base their style, consciously or instinctively, on lecturers who have impressed them; they may even copy the form and content of lectures they have heard. In our view there are three essential

questions a lecturer must ask himself.

* Why is he lecturing?
* What use is he making of the lecture in practice?
* What use could he make of it and what might he wish to make of it?

In this section we begin with the first question. In answering it every lecturer moves on from defining his objectives to asking whether a lecture can satisfactorily achieve these objectives. So from the question "Why are you lecturing?" we move on to the evidence provided by research into the lecture's effectiveness before exploring wider possibilities in subsequent sections.

1. WHY ARE YOU LECTURING?

It may be that you were simply allocated ten lectures in the timetable. But you may be lecturing by choice, if so is it because you have specific purposes in mind, or have you inherited beliefs?

Lectures, you may agree, structure knowledge for the needs of particular groups of students and to meet the purposes of particular courses. The lecturer can show the connections and relations of his subject at a level of complexity and with the emphases and pauses appropriate to the understanding of his audience. As a course of lectures progresses so he unfolds his theme in stages that are complete to each lecture but that have a rhythm he can develop through the series, now giving it amplitude, now excitement, pacing its evolution in response to his audience. Knowledge

ceases to be personal and private. The presence of the lecturer creates a bond, a community of interest.

"Where the object is first to arouse interest in a science, to create a belief in its value, to direct attention to the essential facts and problems, to present general leading points of view and thus to bring the students into active touch with the subject, even an excellent book accomplishes less than a lecture which only moderately fulfils its purpose, but which has behind it a living human personality. All faith is transmitted from person to person."(3) There is something here that is difficult to confute. But such beliefs cannot be a justification for lecturing for those who had taken it for granted that 'to teach' means 'to lecture'. Have you thought about what it is that you hope your students will have learned from your course at the end? Present authorities suggest that the questions you ask should be these.(4)

1. "What do I want to get across to my students?
   What knowledge of basic facts and terminology, of sequences, of classifications and criteria? What knowledge of the practices and procedures of my subject?
   What knowledge of principles and theories?"

2. "What intellectual skills and abilities do I wish to foster?
   Simply to be able to comprehend?
   Or to relate what I say to wider contexts, other material?
   Will I expect them to be able to apply theory

and generalisation to specific instances, to solve problems?
Will I expect them to have begun to think beyond what I have given them - to determine implications, corollaries, consequences, by themselves?"

3. "What attitudes and values should I wish them to adopt?"

If you are already thinking in terms of using lectures alone to put into effect the answers to these classes of question you should perhaps take a step backwards and go over the broad aims and particular objectives of the department in which you teach and of the course you are to teach; the lectures you are to give should be seen as part of a wider instructional strategy. What methods are to be used for which topics or for handling which aspects of learning a subject? Where can they fruitfully overlap and how are they to be combined?

Students clearly gain most from a mix of methods; perception of a subject changes when it is viewed from different angles; understanding may be deepened when a topic is treated in different ways. There are various means of setting a subject out and different ways for the students to express their understanding or to practise intellectual skills and the organising of knowledge for themselves. But students learn in a variety of ways, too, a mix of methods means that most of them have a chance to learn about a subject in the learning situation that suits them best at some stage in the course.

It is impossible to say just what kind of learning takes

place in a lecture nor can it be guaranteed that what a lecturer intends to provide will actually be the experience of any particular proportion of the audience. Insofar as learning has been described (by educational psychologists and research studies) in ways that are presently satisfying it seems to be a complex, individual and multi-dimensional process. No two students have the same range of abilities, the same kind of motivation, the same attitudes towards learning nor quite the same ways of learning. Bolstering lectures by the provision of other learning experiences is then, in a sense, a necessary insurance.

In any case it is clear that lecture-learning is never confined to the lecture period. It can begin long before the audience assembles and may come to fruition some time afterwards. A lecture is planned with this in mind. The lecturer may develop his lectures from what is being studied elsewhere, he may prescribe specific background reading as preparation for a lecture, suggest further reading to develop what the lecture sets out or examine some of the issues expounded in greater depth during supportive tutorials. Strang[2] suggests that a lecture in the humanities should overlap with, and be supported by, at least five hours of related work. The point is to think of the whole pattern from the start. Forward planning is essential if a course is to be an organic whole.

Here is an example. A chemistry course has amongst its broad aims teaching the students the ability to apply knowledge to new situations. This translates into "knowledge of experimental techniques and methods for

the design and analysis of experiments". At a behavioural level - that is describing what the students will be able to do at the end of the course - this then becomes a list of the various pieces of equipment students will become familiar with, the type of experimental work they will practise and so forth. Amongst them might be, for example, "The student will be able to use ultra-violet and infra-red spectroscopy for quantitative analyses". The instructional strategy is planned around a curriculum that leads the students through mastery of essential knowledge and the application of this to experimental work first at a fairly elementary level and then on to the stage where students work perhaps on sophisticated projects. At every stage the instructional strategy may include

* lectures on theoretical background,
* lectures on experimental strategy and design,
* lecture-demonstrations on the use of sophisticated equipment,
* formal laboratory work to practise techniques,
* open-ended experiments coupled with tutorials on strategy, data-handling, conclusions and hypotheses, experimental design,
* projects that present unfamiliar problems.

However look now at how research evidence defines the lecture in comparison with other methods; it is not a multi-purpose tool but neither is it as limited as some would have you think.

2. HOW RESEARCH STUDIES DEFINE THE LECTURE

The lecturer wishes to know what he can reasonably expect

to achieve. Naturally he wishes to know whether evidence from research studies can define the limits of the lecture's effectiveness as a teaching method. There are two caveats to be made before describing the evidence that is available. The first is that education is an applied discipline and teaching in higher education may be so context-specific that it is wrong to generalise at all from the empirical studies that have been made. The commonsense approach is to measure what is said against your own direct experience and that of your colleagues.

The second caveat concerns the nature of educational research. Most approaches to the evaluation of teaching adopt one of three strategies:

measuring learning outcomes
describing teacher characteristics
analysing pedagogic behaviours.

But none of these is validated by any demonstrably logical relation between teaching and learning. This relation has yet to be defined in any satisfying way. In practice these concepts remain essentially personal and situational. Furthermore no normative theories have yet been produced that could be a proper foundation for designing research studies and the data so far accumulated does not provide an adequate basis for the construction of such theories. There is confusion between measurement, description and evaluation and unreal simplifications are made that disguise the true complexity of teaching situations.(5) Comparative studies often assess the false antithesis of two teaching methods or ignore the effect of intervening variables and such factors as students' and teachers' abilities, enthusiasms, personalities, personal objectives and attitudes towards

the method. The results, not unsurprisingly, are inconclusive. If you are interested in the new directions educational research is taking, consult our list of further reading.

There is no unequivocal research-based evidence as to what the lecture can or cannot achieve in terms of what students learn, but the evidence is a solid enough basis for suggesting that lectures have limits. (The following summary is based on two major reviews.)[6,7]

* The evidence suggests that the lecture can be as effective as any other teaching method for expounding a body of facts and principles though there is no proof that it is more so. The only method that may have an edge over lecturing is guided reading. Cost-effectiveness is usually thought to come down overwhelmingly in favour of the lecture. Bearing this in mind - that the lecture is as effective as any other method - it is startling to find that the recall and retention of information presented in lectures (50 minutes of continuous verbal exposition) is very poor. Less than half is remembered immediately afterwards and half again is lost within a week.[8]

Furthermore assimilation of material, though the level relates as would be expected to prior knowledge of the subject and to intellectual ability, falls off, it often seems, as a 'talk' lengthens. Falling off begins to be apparent after 15 minutes[9] so the lecturer will look for means of breaking up his lecture, of holding

attention for longer and of impressing his material more forcibly upon his students. This evidence comes from examination of lectures or talks whose audiences did nothing but listen. However, when notes are taken this probably does not in itself help students to remember unless the notes are used.[10] Note-taking may help them to pay attention.

There is a widely held view that there is a reproducible pattern that audience attention follows. It begins at a high level and as it declines it sinks steadily into a deep trough after about 40 minutes before reviving somewhat in the last few minutes.[11] This need not always be the case; students' attention does not inevitably decline. Indeed in a recent study where students were taking notes during the observed lecture attention remained fairly steady apart from the heightened moments at the beginning and end of the lecture.[12] (What did disturb the authors was the poor quality of the students' notes and the inaccuracies they contained; students' notes are looked at again in connection with handouts in Part II.)

Still it may not be fair to measure all lectures by the rod of remembered content; the lecturer may be seeking to communicate something more than this. Perhaps he hopes that the way in which he presents his material will compel the students to make critical judgments upon it for themselves. Does he hope, too, that the clash of the unexpected views he successfully beds together within the coherent structure of his lecture will provoke thought?

* The evidence suggests that lectures are less effective in stimulating thought than methods such as small group discussion and projects that let students use knowledge themselves.[6,7] Current ideas about how students learn support this view as do experienced teachers.

Is the lecturer himself influencing his audience's attitudes towards his subject? Disciplines are developed and advanced by means of ongoing arguments. In a lecture this may be seen live. The lecturer, exemplar of his discipline, demonstrates its conventions and practices. His attitudes towards the subject, especially interest and enthusiasm for it, are said to be 'caught' not 'taught'.

* There is NO evidence that lectures effectively shape attitudes.[6,7] But how does one measure subtly or gradually changing attitudes?

Perhaps students only take up the historian's stance when they themselves become professional historians. Common sense suggests that lectures may arouse enthusiasm and influence attitudes but it would be extravagant to claim that all lectures can do so. And perhaps 'scientific' attitudes and those that lawyers and doctors might call clinical may be more effectively passed on in small group work. There students have more opportunity to analyse their judgments and condition their responses in respect of actual, professional case-studies.

Not all lectures, indeed perhaps not very many, can be claimed to excite the intellect but few in the academic

world have not experienced the imaginative emotion that is aroused by vividly conceived ideas. J.S. Mill[13] held this to be no illusion but a fact. Further, many people have been present at lectures where they were 'caught up' and seemed to share in both the moment of conception and the development of ideas. It seems excessively reductive to cite T.H. Huxley, Sir William James and others for engaging minds and stirring imaginations in this way - and to cite them when warning others against trying to emulate such powerful teachers.[8] Many academic minds will be unsympathetic to the idea of deliberately seeking to cause excitement and indeed this cannot be accepted as a pedagogic ideal. But where excitement exists, where ideas have strength to engage you, this should not be disguised.

We have moved away from the evidence research has so far provided, for it gives no indication of a lecture's particular virtues. Teaching is a living craft. One cannot see the lecture in the round without putting the accumulated experience of tradition and of those we respect alongside the evidence. What are its virtues?

3. HOW DISTINGUISHED TEACHERS DESCRIBE THE LECTURE

From a professional point of view the lecture can be seen to have distinctive virtues. Firstly, within its competence as a purveyor of information, the lecture is held to be particularly valuable for "introducing and opening up a subject and students can be led into subjects that would otherwise prove too daunting for them".[1] Where texts are in over supply, or where

they present too many conflicting viewpoints then lectures can chart the territory and the students can learn much from seeing how the lecturer sets about the task; where texts are lacking, lectures can define a course.

The systematisation of knowledge is something all agree to be necessary. How far should the students be left to do this for themselves? This question is more easily answered for those students who are new to the subject or to higher education. For them, lectures can provide a framework within which later knowledge can be fitted and which can itself be modified in the light of independent study. More advanced students can learn much from doing their own structuring. After all soon they will not have a lecturer to do it for them!

When one thinks of the structure of knowledge, lectures can be seen to have advantages for the presentation of material with a developmental structure, or conceptual complexity. Not only argument but flow charts and conceptual maps can be created step by step; molecular syntheses and structures, engineering constructs, physical and mathematical concepts can all be built up three-dimensionally.

Where texts are limited, lectures can do more than define the course. The lecturer can present students with a synthesis of available knowledge on his subject, including that which is not easily accessible to them, that is uniquely of the moment. This is another virtue that is widely claimed for the lecture; it can have a particular quality of immediacy. Where knowledge is advancing rapidly the lecturer can present up-to-date

information. He can also give fresh interpretations and correct statements in standard texts shown by later research to be erroneous. Further, he can make his material relevant to current events; in subjects like law, economics and the applied sciences material can be related to topical problems and matters of current public interest.(14)

Can the lecturer bring his subject to life? There is no evidence that he can transmit values and attitudes but it is nonetheless widely held that he is a model of how a person is excited by the power of knowledge, engaged in acquiring it, expounding it and applying it to a variety of problems. He is a model of personal relevance that students can imitate or challenge.(15) He gives the students some idea of how to draw defensible conclusions and of how, in his discipline, data, ideas and conclusions are handled.

Something of the flavour of academic progress in the making is therefore given in a lecture. A lecturer can not only bring in his own ideas but his laboratory results.(16) He can try out theories in their infancy. This can, of course, be misused and the newly-fledged scholar who overplays his recently completed thesis will soon lose his audience.

4. WHAT A LECTURE IS IN THE STUDENTS' VIEW

Have students been asked how they regard the lecture? Indeed they have. By and large they see its main functions to be imparting information, providing a

framework for courses and indicating methods of approaching a subject.[17] Lectures are not as popular as small group teaching methods but they are not all that unpopular! Dislike of lecturing is centred on the one-way nature of the lecturing process and on the poor performance of lecturers.[15,17,1] For those interested in student evaluation of teaching methods, the values, attitudes and levels of academic achievement of those who like and dislike lectures have been investigated.[18] It may be that students in different areas of study look to their ideal lecturer for different things - for stimulation and enthusiasm in the arts faculties and for lucid expositions of complex information in the sciences.[19] You might consider that this is not necessarily the limit of what one seeks to provide!

A lecture may have a special social function. It provides for variety in learning situations, a change from solitary study and - mirabile dictu! - from active participation. In so doing it may be a refuge for new and insecure students, being at once a shelter from critical attention and an activity that makes them at one with their fellows. It can be seen as a 'corporate venture' and may provide contact with a broader spectrum of other students. At its best it may provide a "curious sense of communal thinking and doing".[14]

However many students keep coming to lectures for a reason that most lecturers dislike. Lectures give them clues about what will be examined and cues that the skilled games-players are quick to translate into guidelines as to what to study, which aspects to concentrate on and how to present topics for assessment.[20] Assess-

ment is an integral part of teaching. Degrees are awarded on the basis that successful students will have mastered a body of knowledge (and particular ways of structuring, evaluating and applying this knowledge) within a specified period of time. While this remains the case lectures will go on providing a useful demonstration not only of the distinctive methods of a discipline but of the level of achievement students should aim at and the point they should have reached by a certain time. The lecture is criticised for making no allowance for differences in ability and the varying pace at which students assimilate knowledge. The structure of courses, time-tables and traditional examinations and the system of student grants ignore such differences too. The tortoise and the hare run in the same race.

5. WHAT IS A LECTURE? A SUMMARY OF HOW IT HAS BEEN DEFINED SO FAR

* Fifty minutes of continuous exposition that is not always spoken and not always delivered by a single lecturer.
* An expository teaching method that is as efficient as any other method at conveying facts and principles but is nevertheless not very efficient:
  students' attention is difficult to sustain,
  students' recall of lecture material is poor,
  students' lecture notes are inaccurate.
* A less effective method of promoting understanding of a topic than, for example, small group teaching methods.

* A personal presentation of a subject that may or may not influence students' attitudes or arouse their interest and enthusiasm.
* A means of providing for diversity in learning experiences.
* A tool to use as part of a broad instructional strategy.
* A gathering of students who may sometimes view lectures as a more valuable source of information about what is to be studied, what is to be examined and what their teachers are like than of factual information about the subject of the lecture!

PART II
TO EXPOUND

Lectures may, then, be used with a variety of purposes in mind (any lecture is likely to be improved by the lecturer having some purpose in mind!) but exposition is the lecture's prime function. University teachers do mainly lecture because this is an economic and moderately effective means of giving students an account of the issues and events, the facts and principles with which they need to become acquainted.

But while a straightforward account of a topic may be the simplest of lectures to construct, if the lecturer's purpose is to inform the majority of his students he must take care that the lectures themselves do not defeat his purpose. Lectures must be accessible to students. This means firstly that they are pitched at the right level, secondly that the lecturer puts his subject over effectively. A master of direct exposition has probably acquired the kind of skill in construction, presentation and communication that we describe in "Lecturecraft", but not only this, he has also learned scrupulously to measure the weight of information in his lectures.

When a lecturer sets out to expound he faces the paradox that the more informative a lecture is the less well-informed many students may be; encyclopaedic lectures

are self-defeating. Some students are quick to comprehend what they hear, others find it difficult to take in a verbal exposition, though some of these may nevertheless be skilled note-takers. Yet others not only need more time to take in what they hear but also find that when they come to working over the lecture later, at their own pace, their notes are inadequate. It will not be only the idle and the inept who fail to record all that they need to know; some students are inherently less able to absorb or make sense of a continuing flow and constant pressure of information.

When their main purpose is to give an account of a subject few university teachers would wish their lectures, or the students' ability to comprehend and take notes at speed, to be the factors that determine what each student makes of the subject.

We would say that when the answer to "Why lecture?" is "To expound" then the lecturer must not only ask himself "What do I wish to get across to my students?" but two further questions. First, "How much of what I wish my students to know <u>can</u> I present in lectures?" We look, in this part, at ways of reducing the content of lectures; for teaching purposes reduction is not always to be achieved by distillation. And second, "What can I do to ensure that most of my students do end up with a reasonably full and reasonably accurate account of what I wish them to know?" We examine the use of duplicated lecture-notes, reading lists and supportive handouts. We also look at the notes students take and ways of helping them to improve their own notes.

1. REDUCE THE CONTENT

Expository lectures are often over-weight; some lecturers are addicted to coverage of a subject; there is always more to be said. Lectures are as effective as other teaching methods for transmitting facts and principles but this can be looked at the other way round. Remember that

* other methods are as effective as the lecture;
* the unsupported lecture, like other methods, is not very effective (perhaps a few facts can be drummed into anyone's head but given a mass of information to master some students will not be able to absorb very much at once and some methods of presentation suit some students better than others do);
* slimmer lectures are livelier.

An expository lecture is not, of course, just a roll of facts and figures. It is more usually intended to achieve an amalgam of facts and principles, or an interweaving of ideas and events, so organised as to present a view of a subject that relates directly to the particular purposes of a course. Nevertheless if your lectures are very dense can you, perhaps, redistribute the material so that other methods can take some of the weight?

If in the lectures you concentrate on a clear exposition of principles or of the pattern of events, including only that factual material essential to making an argument, illustrating a theme or giving substance to a thesis, then other methods could perhaps be used to

present the full facts, literature surveys, full reviews of evidence, details of methods or of instruments, calculations or descriptions of all the events, instances, similar pathways or families of compounds that follow the pattern and with which students should be acquainted. Sometimes it may be that whole topics are better presented by another method. For example where a complex explanation builds up step by step a learning programme permits students to follow it at their own speed. Students may, too, find it hard to hold onto the thread of discourse during a lecture where the examples used are too complex really to be described in parenthesis as the lecture proceeds. Or students may lose their way when several sequences of events are described in making a point, similar in some respects but significantly different in others. A guided reading programme, a file of papers for students to consult, a set of tapes or of tape-slide packages would allow the students to look at each example or each sequence separately and to compare them and go back over them at will.

However, many a lecturer preparing an essential series of informational lectures may be unwilling to fragment his exposition; it may seem wrong, as well as being troublesome, to separate out for presentation in another medium material that the logic of the subject requires students to cover as an integral part of a course. Even the knowledge that to be effective as a communication a lecture may need to be a more elaborate presentation of less material may not sway him.

We argue against this that coverage can be illusory; students seldom take everything down.[21] But if they

are to consolidate what they have learned from the lectures they do need notes to review[10] so if you give very substantial lectures you may need to give out very substantial duplicated lecture-notes to ensure that every student does have the opportunity to cover the subject as thoroughly as you would wish.

A good rule-of-thumb for a new lecturer to adopt is that there is much that could be covered but he must first decide what should be covered and then what really must be covered.

What must be covered goes into the lecture, though some of this material will also be presented for the purpose of reinforcement and for the sake of accuracy in accompanying handouts. What should be covered may be presented by other methods in parallel with lectures, sometimes this will overlap with material in the lectures. Students would be directed to such material and strongly recommended to study it; it is an essential part of their course work. Finally much of what could have been covered can be made available for students to use in their own way and when they wish. Broadly speaking this kind of material can go into resource files; we look at these more closely in a later section.

Material that should be covered and might have been included in lectures can, then, be presented in parallel elsewhere:

* in text books - a general reading guide can be handed out or students are asked to read selected passages before each lecture;
* in learning programmes that students work

through on their own;

* in learning packages, along with explanations of principles, diagnostic tests and tutorial help, in developmental courses of self-paced, individualised instruction;
* in extensive back-up notes or in brief supportive data-sheets.

Learning programmes and self-paced systems

Learning programmes and packaged, self-paced, instructional systems are two ways for students to learn facts and principles. Programmes may be slightly more effective for this purpose than lectures are[7] but they are only a viable alternative when they are to hand or can be bought in forms that match a course syllabus and its objectives. It is often only possible to start building learning programmes from scratch when there is a stable core to a course that can be translated into a programme; much time, money and some experience are needed.

Similarly self-paced instructional systems may be the best way to present complex conceptual material, and the factual data that must support it, in subjects like medicine, physics and engineering where mastery of content in a pre-determined sequence is of real importance. They allow students to take periodic mastery or diagnostic tests, and there is provision for recapitulation, perhaps via remedial loops, and for repeating units until a satisfactory score is achieved.

Where learning programmes and packages complement a course of lectures directly they may have to be timetabled to match the progress of the lecture course.

Students who fail to complete programme units may have to be advised to skip parts in order to keep up with the lectures; they can go over them again at leisure when they come to revising. However, what most often happens is that the learning programme, or system of self-instructional units, becomes the core of the course and lectures are then designed to fit in with or eventually to supplement them. For a fuller account of these methods you should consult the further reading listed at the end of this booklet. We discuss lecture-notes and handouts later in this part.

2. EDIT THE MATERIAL

Whether or not they are ready to excise material from their lectures for presentation elsewhere most lecturers do comb through their prepared lecture material for redundant content. We make the point in "Lecturecraft" that too much detail may obscure rather than clarify a lecture. Which topics are used to fatten up an account because in the past someone did some good work on them and they are always written up in the literature? What has been included because it completes a properly round look at a subject - is it there for tidiness or because understanding of the subject is incomplete at this level without it? Some of the material becomes superfluous; it falls into the category of material that could be covered. It can go into a resource file which students will know about and to which they can have free access to make use of as and when they wish.

What sort of material is combed out? Interesting minor findings from research, statements of principle that were

important in their time as variants of mainstream thinking; everything that has been said on a subject does not need to be said again, this is self-evident. Everything that has been found out is not a relevant part of every account of a subject. And what is usual in scholarly expositions of a subject is not always a necessary part of a course of lectures.

Thus while an "Historical Introduction" that picks out the significant trends and quickly analyses the developments pertinent to the understanding of later material can be both stimulating and illuminating, a chronological survey is too often given as the first lecture of a series only as a matter of course. It can be anything but an appetizer. Could you not begin at the other end with a look at the frontier territory? Demonstrate the present relevance of a subject, outline the identifiable movements of current thinking and discuss the points at which the frontier may be being breached. If students are to exercise judgment, to understand the true significance of these matters and perhaps, in time, to make a contribution of their own then ... and so one introduces the areas that are to be studied in depth and shows them how the course has been structured and what is to be covered. At certain junctures as the course proceeds past developments may become sharply relevant, a shift of emphasis may then be required if the connections between ideas are to be understood. To do this there must be familiarity with the roots and branches of the growth of the corpus of knowledge concerned. Can you give enough background in an aside at the point where it is needed or should you have given that "Historical Introduction" after all? But then need it have been a live lecture? Such thinking-out-loud,

such constant questioning is often in the mind of the effective teacher.

Of course students can be asked to prepare for the lecture course by reading up the background for themselves, but a whole lecture providing a neat summary of historical development at the level that suits the course can be duplicated or tape-recorded and filed for student use. When playback facilities are available recording may be the cheapest method to use. Other clips from the cutting room floor could be recorded at the same time; some students will prefer the 'Master's Voice' to more impersonal sources of information.

There may be many students who like this method of self-access learning; perhaps you might expand the material to include more examples, illustrations, expositions of parallel themes or opposing arguments that it would be pleasing to develop in full. These could supplement the lecture. Some students with a hunger for coverage may find your new, slim, lively lectures insubstantial; here is a way of providing for them. A teaching resource file of material that can be made easily accessible to students and that is so structured that it can still be related to course work is a move towards the more flexible teaching that is so widely discussed today.

You can, of course, go even further and <u>begin</u> with the equivalent of a resource file. Sometimes the best way for students to get to grips with a subject is to go through material and to decide for themselves how necessary and how relevant specific topics or points of information are to that account of a subject they and their teachers

think proper. There are real enthusiasts for do-it-yourself lectures, instant lectures and lecture-kits. For example, Hatch[22] used to give out disorganised sheaves of data, original papers, transcripts of other lectures and so forth before a lecture. The students came primed with facts and having additionally read set passages and articles tuned to the wavelength of the coming lecture's theme. The lecture itself consisted of an exploration by lecturer and students together of the way in which theories and interpretations evolve. The first step was to arrive at a definitive statement of a problem that was the real core of the lecture; this was then analysed. Diagrams were constructed together, inferences made, conclusions arrived at in concert. The lecturer was necessarily expert in the particular skills needed to conduct such an exercise and he simultaneously provided a demonstration of how an enquiry may proceed in real life. He "asks questions of himself and of anybody within hearing, chuckles at his own irrelevances and gloats over some unexpected association or the unexpected source of the association". Pure vaudeville? This was a serious pedagogical exercise, not to be dismissed out of hand without further examination of the benefits that can, it seems, genuinely accrue from the satisfaction of students' curiosity about the actual process of real enquiries.

Epstein's[23] account of the use of research papers by non-specialist students should be read and Webb's[24] of how students can put a lecture together themselves and then record it for others' use. It too seems an effective method of instruction; the students who prepared the lectures mastered the content. As a final example,

consider how Cotgrove[25] completely supplants the lecture by a lecture-kit. He teaches by topic. Handouts are given listing the main problems, questions and issues (that he would have discussed had he given a lecture) together with notes on where these points are raised in key texts but with no factual digest of information. A study pack (or lecture-kit) is available in the library in which there are influential or controversial papers together with all the other materials the lecturer would have used. His lecture periods are now used to give 'one-off' lectures. This is, of course, becoming something of a supported guided reading course, or an approach to self-paced packaged instruction.

We do not offer these alternatives to the lecture as better methods of exposition, but simply as illustrations of how standard techniques can be varied, extended and enriched. You remain the judge of how apt they are for your teaching situation.

3. USE HANDOUTS, LECTURE-NOTES AND READING LISTS

We hope to include a fuller treatment of handouts (using the term to embrace the complete range of materials duplicated and distributed to the students) later in this series. Meanwhile we propose that a lecturer can usefully classify the printed or duplicated material he uses in conjunction with lectures; these can be lecture-notes prepared as a guide to students to enable them to get full value from the lecture, handouts of various kinds and reading lists.

By lecture-notes we mean notes that relate directly to

a lecture's actual content, we include anything from a synopsis, a specially prepared summary or an outline of a lecture's theme to a full transcript. Anything that takes the form of background material, or factual supplements to a lecture (i.e. material which extends what the lecture covers) we call supporting handouts. Obviously this kind of material will frequently be combined with or overlap with lecture-notes. Reading lists belong with either.

Lecture-notes

Lecture-notes are often handed out without much thought; they become a habit. A lecturer can usefully ask

* what is the purpose of lecture-notes, if any?
* how can their content be related to their purpose?
* when should they be used, bearing in mind the need to maximise learning?

Let us start with the simple question, much debated, of purpose. Why use the lecture-notes at all? Obviously students should know what lectures are to be about; lists of lecture titles may be published on notice-boards, details of courses and sometimes lecture synopses may be given in course guides. But should these be expanded to give students summaries of the lecture content to be handed out before or after the lectures themselves? There are no clear answers; research is sparse and practice varies between departments. Nevertheless the precepts of what is held to be good practice and principles deriving, however tenuously, from research, do provide guide-lines.

It is sometimes suggested that the very act of making a

note itself helps the student to order the lecture material in his mind. (Though perhaps some students lose the thread as they stop to write.) Clearly, the more accurate the note, the more reliable the learning, especially when one comes to measure long-term recall after the stimulus of revising the notes. (Students who review notes between lecture and test do recall more of the content.)[10] Clearly notes prepared by the lecturer will be more accurate (though less 'personalised') for students vary in their note-taking ability and few take what are judged to be 'good' notes.[21]

If the lecturer is leaving the students to make their own notes he should ensure that they do know, in general terms, what the lecture is to be about beforehand, and he keeps them in mind when lecturing. "This is a point worth noting ...", "Here is the first of three important principles ...", "Put c.f. Bentham in the margin because I shall be referring to this same point when I come to Bentham later ...". The accuracy and utility of the students' notes is therefore in part the result of sound lecturing. The alternative is, of course, to produce the note oneself, to duplicate it and hand it out. This raises the question of when to hand it out and it is obvious that a lecture delivered in the knowledge that the student has a reliable outline in from of him will be different from one where a summary is handed out as the class leaves the lecture room.

As in so many matters practice varies and personal preference is always important. Nevertheless let the choice be one based on some recognition of the implications what you do decide to do may have for student learning. A rough

classification might, therefore, be of value to lecturers considering how best to proceed.

Before lectures lecture-notes can be handed out for two purposes:

(1) To prepare students for a lecture

Well ahead of time notes may be:

* a full account of complex and unfamiliar ideas and topics lectures will deal with. These may be supplemented nearer to particular lectures by study questions designed to encourage students to think about the notes and to relate them to other reading. These notes are not transcripts of the lectures to be given; the lecturer lectures around the notes.
* a synopsis of the lecture accompanied by a list of recommended background reading.

A short time before a lecture notes may be:

* an abbreviated account of the lecture to serve as a preview. (Students who are not keeping up with the course too well then have the chance to ask tutors or friends about anything that, at first sight, is difficult to understand, or whose relevance is not obvious, before that lecture is delivered.)
* a full transcript of the lecture so that the students can decide for themselves whether or not to attend the lecture.

(2) To help students with the lecture

Just before a lecture notes may be:

* Programme notes to help students to keep their

place in the lecture. These may also be a skeleton outline of the lecture provided as a framework for students' own notes, key statements are put in under organisational headings, but space is left for students to fill in themselves. These are the kind of notes students take for themselves.[21] The emphasis is on how the material is organised and on the framework of ideas and theory.

* a general statement of the lecture's purpose and theme, an outline of its development and a summary of its conclusions. The emphasis is on the content of the lecture.
* an outline and detailed factual information: most of the essential facts presented or referred to in the lecture, perhaps grouped under the main organisational headings. The emphasis is on the factual material. (Students do not always regard lectures as a main source of factual material; they may record as little as a quarter of lecture content.)[21]

After a lecture lecture-notes may serve three general purposes.

(1) To consolidate what has been learned notes may be:
   * a summarising outline of the lecture with a reading list.
   * a re-statement of the main points.
   * a full transcript.

(2) To ensure the accuracy of each student's record of the lecture notes may be:
   * a full transcript.
   * most of the factual information presented as

evidence, examples or as the substance of the lecture.

* full and detailed descriptions of the main statements made in the lecture - definitions of concepts, theorems, calculations.

(3) For use in, for example, associated seminars, notes may be:

* a precis of the lecture showing how the subject has been treated.
  a factual account that is, say, a 50% reduction of the lecture.
  (Lecture-notes help to integrate teaching; they can both inform colleagues and involve them more closely in what you are trying to do when they are the tutors for small groups associated with your lecture course.)

Bear in mind the possibility that taking notes may interfere with the concentrated attention that students who like lectures and learn well from listening would wish to give to what is being said. Some students do say they cannot listen and take notes at the same time.(17) Students without notes may recall lecture content better than those who take or have notes - but in the long term they will need notes.(10) Sometimes the retrospective notes he makes will be a student's most valuable record. But perhaps this is more likely to be the case when the lecture is essentially an 'ideas' lecture or one designed to provoke thought or to alter perspectives rather than a straightforward expository lecture.

Bear in mind, too, the possibility that students will be inclined to listen less closely when notes are to

hand, and to read the notes carelessly too. This is why some lecturers never give out lecture-notes until after a lecture. Another practise is to tell the students that lecture-notes will be given out later in the course for some, but not necessarily for all, lectures. The intention in this case is that students take their own rough notes as they go along and rework these for use in related class work. In theory the lecturer would only hand out lecture-notes when performance in this associated work showed that the students needed them; in practice, of course, he would have prepared notes anyway and, more often than not, he would give them out for most lectures - or at least for all difficult lectures. If, as is likely, the students notice this then his hope that every student might make a real attempt to get to grips with the problems on his own could be frustrated.

It is a well-established educational doctrine that immediate confirmation of the correctness of a student's understanding or correction of his mistakes is important for consolidation of his learning; students should not be left to live for too long with misconceptions. A philosopher[(26)] thinks it so important that his first year students should have a full and accurate account of every argument he presents, not least because this is a subject that may only begin to make sense to students after some while, that he hands out a fairly full transcript of his lectures for them to refer to as they wish. He does so before the actual lectures; not all students will then attend the lecture. He does so knowing that it is possible for students to do as well academically working from the scripts alone (there is some evidence

for this.)[27,28] However, he feels that he can, in fact, put over points more powerfully himself; the personal element is important in a lecture. Not only may the lecturer bring force to arguments and bring the subject to life, but students who do not always know a particular teacher establish at least some contact with him during the lecture. This lecturer recognises that not all students will share his view; in handing out lecture scripts as well as personally giving the lecture he deliberately gives them a choice.

An engineering professor[26] sometimes prints lecture-notes for distribution when he thinks one lecture has not gone as well as he had hoped; the notes give a fuller and clearer explanation of points from the lecture that were not apparently grasped by the students. Notes are also used to prepare the ground for subsequent lectures, outlining possible developments and what may be covered, but these are then intentionally incomplete. The lectures themselves are essential, if only because, as he goes along, the lecturer is alert for the small signs that tell him which points are being taken. He may abridge or expand coverage of parts of the lecture.

The full transcript is not a technique that is often used and there are many experienced teachers who would regard it as wasteful of resources. There is, however, increasing use of recordings of lectures (made during a lecture with a cassette recorder) which are placed in media services units for students who wish to revise, re-learn, or indeed to catch up if they have missed the lecture. Those who use this technique should try to remember that a tape recorder cannot see and should try

to speak about whatever they put on the chalkboard. They should also consider carefully whether they are willing to allow the tapes to be taken away on loan and possibly copied.

Thus far we have been thinking of lecture-notes relating to individual lectures, or at most to small groups of lectures; a single topic may spread over several lectures. However, in some subjects a whole course of lectures is the unit of content. The lectures unroll, chapter by chapter and verse by verse, the lecturer breaks off at the end of each 50-minute period and takes up again with a simple introductory "Where were we?" and a brief recapitulation, next week. Lecture-notes may then more commonly be given out at the beginning of term and give an outline of what is eventually to be covered, the theme, the topics, together with supplementary background notes, factual data and reading lists. All this material may be set out topic by topic though this will not be lecture by lecture. Substantial notes of this kind, together with the lectures, may substitute for a basic text. The more substantial notes are the freer the lecturer is to lecture around them.

Improving students' notes

Surveys of note-taking show that few students do take 'good' notes[21] and prepared and duplicated notes may be an essential complement to lectures, particularly for first year students. However, every effort should be made to help students improve their own notes.

To start with we suggest that you make the obvious point to them that notes are of little use if they are

not used (refer to the evidence that students who review notes do better in tests of recall than those who do not.)[10] It may even be necessary to give some students an idea of how to use their notes; it may never occur to some of them to rework or reorganise their notes in any way.

Next consider the use of skeleton notes. Some lecturers compromise on the issue of whether or not to duplicate notes for the students by preparing outlines or summaries with spaces for students to fill in additional points or their own comments. Skeletal notes can also consist of main headings under which are listed not subordinate points but facts that will be presented in the lecture. The notes supply blueprint and catalogue of materials; the lecture is only built up as it is delivered. The students should later on be able to reconstruct the lecture in as much detail as they wish.

At their best notes are a commentary as well as, or rather than, a report and while you may wish to guide your students towards making notes of this kind you can hardly provide a form to fill in that will be a record of each student's personal understanding of each lecture. In some subjects it will be very important that, as their course progresses, students do form their own judgments; in others it matters more that they build up an accurate knowledge of what they are studying - though not all students will wish to have nor be able to handle as full an account as the lecturer might wish to give. Nevertheless surely in all subjects notes should be a record both of the lecture as given and also a personal record of their own response to it?

You might like to try issuing an ideal set of notes early in a course. These could show how notes are organised under headings; how main points are listed beneath them; how personal comments can take the form of cross-references that spring to mind, allusions, personal ideas, the starring of points to bring up in seminars and tutorials, the marking of points of personal interest. Link the issue of such notes to a second opportunity to hear the lecture they accompany; it could be recorded. And lastly try to encourage students to show each other their notes, to compare them and to analyse them together.

Supporting handouts

It is much easier to decide when to distribute supporting handouts and what to put into them than it is to choose how to use lecture-notes. Apart from introductory handouts, that may be used in conjunction with any formal teaching method to describe what is to be taught, where, when and why this method is being used, study questions and reading lists may also be given out ahead of lectures. They focus attention on what is to follow.

Thereafter handouts are used to supplement lectures - being used either to present essential factual material or to enrich and consolidate what is taught. Single supplementary handouts are the easiest way of introducing material where and when it is needed. They can be given out before or during a lecture and include:

* essential references to central points in the lecture;
* formal statements such as definitions, theorems, formulae and the ipsissima verba of quotations;
* data to back up arguments presented in the lecture

such as graphs, mathematical proofs, tabulated surveys, maps, statistical information, a range of examples that will not be discussed individually during the lecture and so forth.

For example, students must be clear about what essential terms mean before they can understand a lecture on Existentialism.[26] A handout defines and explains Essence, Existence, Nothingness, Situation, Transcendence and Contingent. A lecture about the historical development of secondary education includes discussion of a survey by the Central Advisory Council for Education in 1954. A handout gives detailed figures from the report of the survey while the lecturer talks about their implications, drawing attention to the relevant figures as he does so. Handouts allow the use of extracts from primary sources instead of paraphrases. The condensed final summary of conclusions and recommendations from such an official report is another useful handout. The lecturer can discuss the validity of the conclusions in the light of later reports and the impact that the recommendations had on subsequent developments without describing the summary point by point first.

Handouts can give factual information that is not presented in the lecture, that repeats what is in the lecture or that extends what is given in the lecture. Thus there are occasions on which handouts will give more information than is strictly necessary for the purposes of the lecture, pointing perhaps to widening contexts or to the further possible development of topics from the lecture; more able students may wish to go further into a subject on their own. Notice, too,

that handouts can provide a demonstration of essential form; the way in which quotations or references are made, the precise formulation that is a definition, the usual or necessary format for the presentation of data of various kinds. Make this point explicit.

Diagrams are often given as handouts but one of the lecture's virtues is that it allows the lecturer to build up complex diagrams as he goes along. He may be using one only to improve students' understanding of a set of relationships or the course of reactions, and would prefer the students to give him their full attention, but they will copy his drawings. They tend to copy everything that is written on the chalkboard;[21] if the diagram makes things clearer to them now it may make them doubly clear later. So, if you do not wish to lecture to the tops of their heads as they note down not only what you draw but what you are saying about it, give them a handout. But, where possible, give them only the initial drawing, or the drawing in one of its early stages before the lecture. Explain that they can add new features to it as they wish and that you will also hand out the final version after the lecture. They will now be able to make notes separately, not having to keep on making new diagrams on each page as they turn them over hastily - they are ignorant of what is coming, after all, and know neither how elaborate the final diagram will be nor how much space it will need. If you are using the overhead projector - one of the beauties of doing so is that you can use prepared overlays - bear in mind that students may take longer to absorb what they see (let alone add bits to their diagrams) than it may take you to explain each new development.

Reading lists

Reading is most usually either

* prescribed as necessary preparation for lectures.
* recommended as giving a wider and more general background for lectures.
* recommended as giving a fuller, more detailed or more advanced treatment of specific themes or topics from lectures.
* presented as giving students a comprehensive view of a subject that extends it both in range and depth beyond what is taught through lectures.

Clearly then the way in which a reading list is organised and presented will depend on how students are intended to use it. If the arrangement of a list is not self-explanatory and its purpose not self-evident then either it is discussed in class with the students or a prefatory note explains how it is to be used. Err on the side of explicitness; not only should students know exactly how reading relates to lectures but they also need to know why they should read particular texts as well as what they are recommended to read. Many reading lists are far too extensive and too scholarly for the majority of the students who will use them; they want a guide to studying, not a guide to the literature of a subject. (29)

Thus first year students may be given a detailed and directive guide that not only specifies chapter and verse but gives a preferred order in which texts should be read and a time-table that dovetails with the lectures. On other courses students may be given either comprehensive reading lists divided into groups of texts close to the core of the course, those that extend it and those that

treat specific themes or topics more narrowly and in greater depth in ways that are still relevant to the taught course; or a series of short topic-related lists handed out as the topic is approached in the lectures.

There are always a number of students in a class who hope to specialise in a field after graduation or who have a great capacity or appetite for wider reading. Reading lists are one of the best ways of providing for those who wish to go beyond the taught course. And it is not always the more able students and the specialists who may like to go beyond the strict bounds of a formal syllabus. (Research suggests that students can be categorised as more or less syllabus-bound and more or less syllabus-free.)[30] These students would like lists to be categorised not because they wish to know which texts or how much reading is essential, how little they need read, but because they wish to know which texts are full and scholarly treatments, which make a distinctive contribution to the subject, which represent different approaches to the subject, and which are eccentric and controversial.

Thus a reading list, more bibliography than study guide, may be an optional supplement for some classes; an extra category may be added to the usual list for others. Such fuller lists are annotated to give the flavour and values of texts, students can then pick their own distinctive path through the wider literature of a subject, whereas the shorter lecture-related list is annotated for the purpose of integrating reading closely with the taught course.

PART III

FOR VARIETY

It may seem ridiculous to propose that lectures provide variety in an instructional system when lectures have dominated university teaching for decades. We really wish to make the point that lectures, or rather lecturing, may be an essential element in university teaching; there is a place for the considered presentation, the didactic discourse, the selective exposition.

1. THE LECTURE AND OTHER TEACHING METHODS

Lecturing is best thought of as a method - particularly suited to some subjects, some students, some teachers - whose primary function is exposition but which can also be used for special purposes as we show in Part IV. Lecturing per se is used mainly for teaching first year classes and for providing an initial grounding in many subjects. These are the classes that are too large to be taught through small group work or where the students are not well enough informed to contribute much, and therefore to gain much, from active learning situations. These are also the classes whose students need to be given a considerable amount of information in a short time; learning through discussion, for example, is a luxury that cannot be afforded.

With other classes lectures generally overlap and combine with other teaching methods; often there is no need to draw clear lines between different methods. It is quite possible to use methods other than lecturing for expounding a subject and lecture periods for demonstrations, testing sessions or group exercises; it is quite feasible to introduce other teaching methods into an expository, or any other kind of lecture, without muddling one's purposes.

In pursuit of the theoretical ideal of letting students use knowledge and practise skills for themselves as soon after an exposition as possible, a lecture can be broken up by, for example, short problem-solving sessions. The main restriction on the use of such sessions, or of discussion breaks, is the size of a class. In the very smallest of classes, say an honours class taking a special option, the distinctions between lecture, seminar and discussion group become blurred. It is common practice to begin teaching such a class with a short exposition of a topic, taking perhaps 20-30 minutes, and to follow this with more or less informal discussion of the topic or by the group working together on problems that arise.

With a larger class a formal lecture can proceed step by step; exposition alternates with breaks for discussion. Interpolating other kinds of activity in this fashion particularly helps a class to come to grips with new ideas. Ideally new concepts are built on those already established. If several new concepts are to be brought into one lecture a break or two for discussion will allow the students to become more familiar with those first presented

before going on further. The simple passage of time also helps to consolidate what is being learned. In a smallish class of 20 or so discussion can be quite general; even in a class as large as 50 general discussion can take place, but now it will have to be directed and dominated by the lecturer. If some kind of question and answer session is intended, to review the substance of a lecture, it may be a help to have some kind of voluntary chairman to field and edit contributions from the floor.(31)

Another tactic is to ask questions or to set a problem and to get 'buzz groups' to try and come up with the answer in five minutes. Buzz groups are impromptu groups formed by, say, 3 people in one row turning round to talk to those behind them. Allow a few minutes for discussion and then ask one or two of the groups for their answers, or to raise questions. Participation can be widened by asking other groups with the same point to raise their hands.(6) These responses would then be incorporated in the lecture. You will never get this to work if the students are not forewarned and are unacquainted with the technique. In any large class the students must have foreknowledge of what they may be expected to do; when they do not it takes so long to get anything organised that the exercise is a waste of time. Even if all you mean to do by way of innovation is to question them directly warn them that you mean to do so.

Questions for discussion during breaks in a lecture can be prepared beforehand so that they can be thrown up on a screen or handed out round the lecture room. Problem

sheets can become quite elaborate; they are used quite a lot in medical schools where they become, in fact, part of a systematic way of teaching subjects like anaesthetics. A typical format would be an initial lecture, shorter than usual and concentrating on principles and their applications in practical medicine; then a period for working problem sheets that have been handed out at the beginning of the class. Finally, a lecture-discussion would be devoted to reviewing the sheets, the correct answers and the errors that have turned up.(32) Here is a way of ensuring that misunderstandings are cleared up as they occur and have no chance of becoming a rooted part of any student's 'knowledge' of the subject. Advocates of this method say it is so much more effective than long sessions of exposition and explanation (judging by what students remember) that they have been able to include more material in the course.

The commonest criticism of lecturing is that it forces the students into a passive role. We have given examples of how discussion and problem-solving can become part of a lecture. Other procedures, while not involving much physical activity on the part of the students, can change their pattern of response. One such example is a demonstration. Lecture-demonstrations have been used in the sciences for decades. They need not smell of mothballs. Time-lapse, X-ray, or slow motion photography can be used as a modern approach to demonstration. One could use film clips, or loops, during the lecture with a back-up display later of, for instance, models, electron micrographs, material samples and experimental equipment.

Case studies can be used very effectively in a lecture. Social and business studies lecturers can use specially prepared videotapes. These can be scripted from a conglomerate of actual cases and produced to emphasise and dramatise the characteristics chosen for the purposes of the lecture. The tapes can be interrupted at will for the lecturer to underline points, to ask questions, or to elaborate. Similarly real cases can be recorded on film or video-tape for plant pathologists, medical students or engineers. The film can be stopped, or supplementary stills (or slides) can be used where special features need close attention. In this way a large class can be shown individual cases in close-up detail without, for example, inconvenience to patients. One case may also be cross-cut with another, or with several others, to show variations in parallel.

In psychiatric medicine interviews with patients have been tape-recorded, as have therapy sessions with groups or individuals. The patients' anonymity is preserved and the tapes can be edited to remove the longueurs of slowly evolving patterns of behaviour and to juxtapose diagnostic or illustrative points. Again, the lecturer can interrupt such recordings as he chooses or as the class requests. This technique is also appropriate to law, business studies, ethology and similar disciplines.

Case studies can also be used in the physical sciences where they introduce real problems from on-going research or from the everyday world. By also introducing, as they may do, social, political or economic factors such cases may provoke both a more complex and a more

immediate interest in problems of importance than an exposition of the underlying principles and the nature of such problems might have done. This is one way of giving students greater motivation for mastering dry and abstract principles. Lowe[33] gives, as an example, the case-studies used in Open University courses - the practical problems encountered in the use of solar energy opens the way to rigorous study of many topics.

Where lectures are being used mainly as an introduction to a course of small group discussion work a panel discussion can be used. For instance, in literature studies a course of practical criticism could be introduced by a panel analysing a text that has been handed out beforehand; this is another kind of lecture-demonstration. Two lecturers can liven up a lecture by each presenting different sides of an argument - or one could present the substance of it and the other the illustrative or supportive points. One lecturer on his own might try a dialectic, using the recorded voices of eminent spokesmen to present opposing viewpoints and interrupting them to join in or to invite the audience to counter points, as he thinks fit.

Small group work is usually most closely associated with lectures. Discussion obviously complements exposition. But there may be topics that could be handled more successfully by discussion methods alone and left out of lectures altogether. Note, too, that small group methods may be the most effective way to present particularly difficult topics or for transmitting facts and principles to slow learners - they may benefit from having the material broken down into smaller units that can be taken one at

a time with pauses for discussion and further explanation in between.[7] Comb through your lecture material again! Lectures are frequently used to provide background knowledge for seminars or tutorial work; they may describe contexts or introduce themes that are only developed in full in the parallel small group work.

It is less common to develop the themes first through discussion (in small groups, seminars or laboratory classes) with some requirement for the students to arrive at their own conclusions and present them in an orderly fashion before a lecture is given. The lecturer can then not only take up the threads they have spun and weave them into a finer cloth but can also extend what students have evidently learned along lines that may encourage further independent study. For an example of how this may be done, consult Collier.[34]

PART IV

FOR SPECIAL EFFECTS

1. LECTURES THAT ORGANISE STUDY OF A SUBJECT

Both students [17] and lecturers [1] think that lectures are a particularly good way of showing how a body of knowledge is organised. One or a group of lectures can give a broad survey of the themes that unite various topics or aspects of the subject. They can give an account of the main stream of thought or development within the discipline, briefly show the relation of the department's research and special interests to the mainstream and indicate some individual positions. Such a thematic survey will be intended to provide a framework for later learning.

A network analysis of the over-arching concepts that structure a discipline can be presented - with lower level concepts, still general in nature, built into the network. Logical sequences and causal relationships can be shown, cross-links and cyclic influences established. The network could be set out in graphical form as a handout while the lecture, or lectures, elaborate the concepts and explain the detailed logic of connection. Such lectures could be 'advance organisers' for a subsequent series.[35] (The technique of network analysis can be used by lecturers themselves to plan a whole course.)[36]

Both the thematic survey and the conceptual network could be supplemented by open-ended discussion in small groups about "What is worth knowing?" or "Who defines, and should define, what is desirable knowledge?" One particular theme from the lecture could be picked out for study in a traditional seminar where students present papers on different aspects of it in greater detail or depth than the lecture does. The relation of a discipline's distinctive methodology to thematic development could be illustrated by study of a single theme in this way.

2. LECTURES ON THE APPLICATION OF PRINCIPLES

Another example of a special use you might like to make of lectures would be to teach the application of a discipline's basic principles, beginning at an abstract and theoretical level and spiralling down to show how to make models that use the principles in actual practice. Small groups could obviously make such models.

What about skills and problem-solving strategies? Where skills (practical or intellectual) cannot satisfactorily be practised in the lecture periods the teacher will try to mesh the practical, tutorial or other classes in to the lecture programme. Lectures are not ideal for individual or group practising of skills but students can learn much from demonstration. The strategy and principles of skills and problem-solving are usually described straightforwardly with illustrations and examples. It may be of great value to inexpert or inexperienced students if, instead, skills are demonstrated. Problems can be worked through like an advanced motorist's test.

The lecturer talks it through, showing the use of the appropriate techniques but also naming every step of each process, and the cognitive skills being used. Thus instead of giving an account of the inferences drawn from illustrative data he would say, "I have evaluated the data and it has been tabulated. In cases like this the usual format is ... Next I look for patterns. The inferences I can make are ..."(37) He could further describe the intuitive steps he takes, the lines of his thought, how he recovers from dead ends and tries to show how the tactics which in time become instinctive may be developed. Students can be asked to join in, if only in making calculations.

Parallel work will concentrate through discussion on data interpretation, designing experiments, the components of skills and the principles governing their use, the suitability of various strategies for a variety of problems. Practical exercises accompany these discussions.

3. LECTURES THAT ARE A PAUSE FOR THOUGHT; 'ONE-OFF' LECTURES

You can see that even where lectures are generally straightforward expositions of a subject one or a group of lectures might be used for special purposes; they can also create special effects. A sequence of lectures can be interrupted by one that pauses to expand and review the learning experience. At a key point in a developmental account of a subject such a lecture can, out of time and out of step, present the transparent layers of how it appears at different levels of organisation, from different viewpoints, through different modes of perception - creating a "multi-dimensional

simultaneity".[38] Such a lecture can thus create a pause in which the mood of a moment can be evoked, perhaps through a form of experiential presentation that establishes the importance of social, historical or intellectual contexts. Or the lecture, bringing together many experimental and speculative threads, can show something of the process of discovery and could be illustrated both by references to present speculation over a wider area than the syllabus strictly covers and by discussion of where it might lead. Similarly some such presentation could show how new concepts have retrospectively shaped a field.

One lecture could be entirely devoted to exploring the growing edges of a field, those parts at present being cultivated, those that could be, the virtues of old tools and of new tools. Some account could be given of current controversies, new directions, the influence of discoveries in other disciplines, and what are likely to be the profitable new avenues of development. This might be a stirring introductory lecture, as we have already suggested, but it could also be a lecture that is used to change focus at a point where one is going to go off on a new tack. It could, too, be one of those pauses for consolidation; what has been covered is reviewed and set in a wider frame. Parallel discussion in groups can widen the field even further by exploring issues barely touched on in the lecture.

Another 'one-off' lecture which, skilfully presented, might stir resonances both backwards and forwards through your course is one in which you do not speak at all. Some subjects of study have a physical reality that is

not normally accessible to students. Description is a poor substitute for experience; representation in other media may bring them closer to reality. Explore film libraries, radio and television archives. Do not be a go-between; give them a film or mixed media presentation without even an introduction. Subsequent lectures can be used to subject parts of this presentation to verbal analysis, or one could use another lecture as a ground forum for comparative interpretations by small groups of students. You could have ready additional non-verbal illustrations to demonstrate points that are likely to be of particular interest or to provoke more far-ranging discussion.

Cowan, a notable innovator in teaching methods[39] thinks that departments often fail to make good use of the resources they have to hand and amongst these he lists staff. He saw an engineering professor's flair for design as something that could be used outside the course the professor taught himself. One result of this was a design competition, forming a part of project work, in which the professor took part. The assessment of his models added spice to the adjudication. Are masterly or exhilarating lecturers only to teach students who take their courses? There must be a place for such lecturers, once identified, to give 'one-off'lectures, perhaps to illuminate dull or dark areas of other courses, or to provide relief from a heavy diet of difficult material, or to stimulate wider consideration of topics by taking them from a new and unexpected viewpoint.

A series of lectures develops a rhythm; at different points in the course one lecture may be plainly

informative, another may be given over to speculation about conflicting theories. And through a series lectures sometimes run over into each other. But a 'one-off' lecture cannot take up where something was left off, its tone is not set by its position in a series. Particular care must be taken to make the purpose of such a lecture quite explicit, to make it complete in itself and to make it the enlivening experience it is meant to be.

4. LECTURES THAT LOOK BACK

It is so natural for a scholar constantly to review his subject in the light of new knowledge or new interpretations that it is easy to overlook the value of arranging teaching material to ensure that students do so too. Understanding of many subjects can be deepened by a spiral presentation; later lectures pick up what has gone before in order to show it to students in a new light.

Biologists and social scientists are accustomed to studying structures at different levels of organisation. The distribution of cell products or of raw materials for industry can be looked at as a transport system, then as a communications system, then as a self-regulatory system of supply and demand, then in terms of costs and of cash supply or energy levels throughout the network, first at one level or organisation and then at another. We are now in the territory of the curriculum developers but we wish to point out how valuable a lecture can be when it is used specifically to clarify how interpretations from differing points of view, or time, or descriptions

at differing levels of organisation may relate to each other. A course taught largely by seminar can be drawn together by one or two such lectures, while in a lecture course reviewing lectures, spaced out at intervals, could mark each turning point, taking up earlier themes again.

Thus a lecturer teaching a course in twentieth century religious thought[26] gives an early account of the effects of the First World War and the November Revolution upon both the dominant pre-war thinkers and the new post-war generation. A later lecture describes the reaction of the same people to the so-called 'conservative revolution' of 1933. The first lecture takes on new significance as the course progresses and the intricate relationship of ideas and events is revealed. The second lecture brings this point home to the students.

PART V
TAKING STOCK

Whatever our views about lecturing it is still true that most dons spend a large proportion of their teaching time giving lectures; lecturing is a professional commitment. Yet it is not entirely startling to find that a review of the expectations of new members of staff in a university shows that the expectation of lecture-laden courses is often accompanied by an implicit rejection of the lecture as a teaching method.(40) This is unprofitable. To be able to lecture well should be the aim of every university teacher. Gross personality defects apart there is no reason why anyone intelligent enough to be appointed to a university post should not be able to identify, practise and thus acquire the skills which go into effective lecturing. Work can be an antidote to anxiety.(41)

However, it is all too easy to lecture by default. Does it matter to you that you may be doing so? Then go back to the beginning again and reconsider your purposes and objectives. Do you really feel that lecturing is <u>not</u> the most profitable way for your students to approach your subject and are you convinced of the merits of using some method other than the lecture? Then you must find out how innovations are successfully introduced and set about it.(42) Equally, if your department has developed,

say, a structured system of a self-instructional kind, which you feel does not match the aims of the course, then explore the possibility of increasing parallel lectures or developing the use of small group work in conjunction with the main system. Costing does not always cover all relevant factors and much can be done by capitalising on assets that are ordinarily overlooked. Explore! But the old hand would advise against innovation for its own sake. An appetite for it is too easily blunted; pertinacity is needed to overcome the many obstacles in the innovator's path. Checked early in his career many a lecturer is reluctant to step out of line when later there are better opportunities to widen the range of teaching methods in his department.

When you do lecture by choice, then as teaching skills mature and you are becoming more certain of your use of the lecture, will you seek to widen your range? Experiment! Observing and trying to improve one's skills, looking for ways to employ them sensibly and taking on more demanding tasks when you become more experienced - these are matters of professional respect for a craft. You will know the old chestnut "Twenty years' lecturing? Giving the same lectures for twenty years, you mean!" No-one expects to become profoundly illuminating, lucid and engaging at a stroke but everyone can try out, just occasionally, a lecture that aims for responses at several levels. New students are open to enlivenment but they are perhaps the most vulnerable guinea pigs; try such a lecture on more advanced students first.

The drift of our argument is this. Tried methods and

familiar techniques allow the lecturer to concentrate on his material. But both lecturer and lectures can become stale. "First year geology once again! Same old lectures, same old students, same old slides from Timor. When was it I was there?" You are bored; they are bored. Couldn't you at least remove the labels to see whether anyone asks "Isn't that Timor?" Are you bored? Would you enjoy making some new slides? You might be able to make them more precisely illustrative of an important point. You might start thinking about why you are making some of the points you do, and would 'shales' go better in the lecture on ... ?

Playing around with material may keep you interested and your lectures interesting. Trying out new methods, new ideas, experimenting - just occasionally - with new techniques may make teaching in itself more fun. And <u>are</u> this year's first years exactly the same as they were five years ago?

Teaching can be seen as an interaction between teacher, subject and those taught. The relationship between the people in that trinity may well be the most important of all. A student's attitude to a subject is as significant as the teacher's. He knows what your attitude is - do you know his? A lecture is enmeshed in a network of relationships when it is delivered. Can you construct it with an awareness of that network?

We have spoken of the need to relate what is taught to the students' interests and activities. It may be that the most effective teachers are those who see it all through students' eyes. In lecturing such teachers

seem to have a knack for presenting material in forms that connect at once with what the students already know and that catches their imaginations. This may be a function of personality; it may reflect an empathy with the students that comes from genuinely knowing them well or it may be that what seems at the time to be a brilliant flash of inspiration is merely the completion of a carefully-laid plan. Perhaps all-important links were thought out long before. We would argue that there is much that can be learned. It is not enough to set out material with respect for the logic of the subject and to illustrate it with what seems appropriate or, carelessly, with what particularly pleases you. Do not be like the geophysicist who was fond of a procedure for making gravity measurements near the sea floor using inverted pendulums in submarines - a procedure unused for the previous twenty years.

Whatever our own predilections we must try to reach out to our students, to establish a link of mutual understanding, of responsiveness, sympathy and empathy. It is easy to 'knock' the lecture by using caricatures; the don who lectures well has mastered the art of teaching. Learn to lecture well and you are well on the way to being a professional in the full sense of that term.

SUGGESTIONS FOR FURTHER READING

This is a guide to further reading. Though many of the works referred to here were major sources for this booklet, and we hope we have given them due acknowledgement, we have in no way exhausted what they have to say.

THE LECTURE

BLIGH, D.A. (1972). *What's the Use of Lectures?* Harmondsworth. Penguin.

The standard work.

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McLEISH, J. (1968). "The Lecture Method" *Cambridge Monographs on Teaching Methods No. 1.* Cambridge Institute of Education.

A selective rather than an analytic survey but it charts the history of studies on the lecture.

SELF-INSTRUCTIONAL LEARNING SYSTEMS

GOLDSCHMID, B. & GOLDSCHMID, M.L. (1973). "Modular instruction in higher education" *Higher Education 2:* pp.15-32.

GOLDSCHMID, M.L. (1974) "Individualising instruction in higher education" *Higher Education 3:* pp.1-24.

THE LECTURE IN THE WIDER CONTEXT OF EDUCATIONAL RESEARCH IN ITS RELATION TO TEACHING

BEARD, R.M. (1970). *Teaching and Learning in Higher Education.* Harmondsworth. Penguin.

This is a straightforward and informative discussion.

ENTWISTLE, N.J. (1975). "Approaches to teaching and learning: guidelines from research" *Paper presented at the Council of Europe symposium on "Strategies for Research and Development in Higher Education". Göteborg, September 1975.*

A clear, readable and illuminating discussion of present thinking which is of direct interest to the teacher.

McKENZIE, N., ERAUT, M., & JONES, H.C. (1976). *Teaching and Learning: an introduction to new methods and resources in higher education.* (2nd edition). Paris. UNESCO.

This is a specialised book but not loaded with jargon; it is stimulating to read, has a good chapter on teaching methods.

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